

REMARKS

Claim Rejections - 35 U.S.C. § 103

The Examiner has rejected claims 9 and 13 under 35 USC 103(a) as unpatentable over Lin (U.S. Patent No. 6,307,268) in combination with Shimizu et al. (U.S. Patent Application Publication No. 6,242,808). The Examiner has rejected claim 11 under 35 USC 103(a) as unpatentable over Lin (U.S. Patent No. 6,307,268) in combination with Shimizu et al. (U.S. Patent Application Publication No. 6,242,808) and further in combination with Wada et al. (U.S. Patent Application Publication No. 5,629,236). The Applicant respectfully traverses. The cited references, either individually or in combination, fail to teach or render obvious all of the elements of the Applicants' claimed invention. In particular, the cited references fail to teach the element of independent claim 9 of "providing a dummy via plug disposed underneath and in contact with the first interconnect and *underneath* the metal plug to provide a reservoir for metal ions to reduce a build-up of electromigration-induced mechanical stress." In contrast, Lin teaches dummy refractory metal plugs connected to an aluminum wire to draw away mobile aluminum atoms, vacancies, or defects from via holes to prevent problems caused by stress-induced migration during a rapid up or down temperature ramp rate such as during WCVD, PECVE, via degassing, etc. (Col. 4 lines 26 – 49.) From Figure 2 of Lin it is clear that the refractory metal plug 11 is not positioned underneath the via 2, but is instead positioned away from the via 2 so that the mobile aluminum atoms, vacancies, or defects are drawn away from the via 2. The placement of the refractory metal plug 11 away from the via 2 and not underneath via 2 is likely related to the different problems that the Applicant's invention and Lin are trying to solve. Lin is solving a problem created by rapid temperature changes applied to aluminum lines in an interconnect structure during processing, whereas the Applicant is solving the problem of electromigration in

interconnect lines formed of copper, silver, or gold when current is passed through the interconnect lines during use. Electromigration-induced mechanical stress is particularly pronounced at bends in copper, silver, or gold interconnects and thus the “dummy via plug disposed ...*underneath* the metal plug to provide a reservoir for metal ions to reduce a build-up of electromigration-induced mechanical stress.” Both Shimizu and Wada also fail to teach this element of the Applicant’s independent claim 9. Therefore, the Applicant respectfully submits that independent claim 9 and claims that depend upon and incorporate the elements of claim 9 are not anticipated or rendered obvious by the cited references, either individually or in combination.

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If there are any additional charges, please charge Deposit Account No. 02-2666.

Respectfully submitted,

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